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VASCULAR DISEASE

RACIAL DIFFERENCES IN DIGITAL REACTIVE HYPEREMIA MEASURED BY PULSE VOLUME AMPLITUDE: THE META-HEALTH STUDY

ACC Poster Contributions
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Background: Compared to Whites, African-Americans (AA) continue to suffer from a disproportionate burden of cardiovascular disease (CVD) that can only partly be explained by disparities in the prevalence of risk factors. Racial disparities in CVD could be, at least in part, attributed to impaired vascular function in AA. Digital pulse volume amplitude (PVA) is a convenient test of microvascular function. Previous studies suggest PVA could reflect nitric oxide mediated vasodilation; however, racial differences with this technique have not been studied.

Methods: We measured CVD risk factors in 570 participants (mean age 50±9 years, 55% AA, 61% female) enrolled in the Morehouse-Emory Partnership to Eliminate Cardiovascular Health Disparities (META-Health) study. Digital PVA during reactive hyperemia (RH) was assessed using the Endo-PAT 2000 device (Itamar Medical, Israel). Briefly, PVA was analyzed at rest and during RH after 5 minutes of forearm cuff inflation to suprasystolic pressure. A reactive hyperemia index (RHI) was calculated as a ratio of the post-to-pre occlusion PVA of the tested arm, divided by the post -to-pre occlusion ratio of the control arm. Lower RHI indicates worse endothelial function.

Results: Compared to Whites, African Americans had a higher prevalence of hypertension (47% vs. 33%, p=0.002), diabetes (13% vs. 6%, p=0.007), and current smoking (26% vs. 14%, p<0.001). Both the baseline digital PVA (309±288 vs. 397±344, p<0.001) and the RHI (2.2±0.6 vs. 2.4±0.6, p<0.001) were lower in African Americans than in Whites. After adjustment for age, gender, smoking, hypertension, diabetes, body mass index, mean arterial pressure, glucose, and lipid profile, African American race remained a significant predictor of lower RHI (☒=-0.177, p=0.001).

Conclusions: African-Americans have lower RHI than Whites, even after adjustment for underlying risk factors, indicating reduced digital microvascular reactivity that may be partly due to impaired endothelial function, and perhaps lower NO bioavailability. Since impaired RHI has been associated with worse long-term outcomes, this may be a useful tool for monitoring risk and following therapy in higher risk populations.